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EXPEDITIONARY AIR FORCES' ROOTS IN THE PAST:

CACTUS AIR FORCE

by

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Preface

This paper is primarily a description of the state of aircrew training and the maintenance and logistics practices employed by an early example of an Expeditionary Air Force: the Cactus Air Force on Guadalcanal in 1942. Secondarily it compares the training, maintenance and logistical problems dealt with by Cactus personnel with the modern AEF now in development. Problems faced and solved by Cactus Air Force are lessons learned that we may be able to use to save time, money, and lives as we develop AEF concepts. The paper examines and enumerates Cactus problem areas and some of their solutions. The technological leap forward from World War II to today has essentially eliminated the problems of the type the Cactus personnel faced, but the potential for problems may exist within the three areas covered.

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Abstract

This paper is primarily a description of the state of aircrew training and the maintenance and logistics practices employed by an early example of an Expeditionary Air Force: the Cactus Air Force on Guadalcanal in 1942. Secondarily it compares the training, maintenance and logistical problems dealt with by Cactus personnel with the modern AEF now in development. Information for WWII-era Cactus Air Force issues was obtained by literature review and archive research. Current AEF information is from open sources and is widely available. Problems faced and solved by Cactus Air Force are lessons learned that we may be able to use to save time, money, and lives as we develop AEF concepts. The paper examines and enumerates Cactus problem areas and some of their solutions. The lack of training for the crews who arrived on Guadalcanal, code-named "Cactus," on 20 and 22 August 42 caused a number of pilots to lose their lives. The lack of preparation for the conditions they would be working and living under dramatically affected how the maintenance was handled. Enemy activity prevented the initial supply stocks from disembarking, and subsequent sustainment operations were chronically threatened. The greatest assets the Cactus Air Force people had were a die-hard attitude and a will to win. The technological leap forward from World War II to today has essentially eliminated the problems of the type the Cactus personnel faced, but the potential for problems may exist within the three areas covered. The Cactus

experience seems to suggest that as long as the AEF attitude is right, nearly any problem encountered can be overcome.

Chapter 1

Old and New Expeditionary Forces

> *That first Army Air Force squadron that came down there with P400's had some of the finest pilots that I'd ever seen, even though they didn't have the best plane in the world. And, they were certainly willing to do anything they were asked to do and cooperated very well with the Marine officer who was running the show there. The fact that the P400 didn't get up high enough didn't bother them a great deal; they always wanted to go up every time they had the chance.*
>
> —Major John Smith[1]

The Chief of Staff of the USAF Gen. Michael Ryan and acting Secretary of the Air Force F. Whitten Peters have mandated the use of the Expeditionary Air Force (EAF) concept in order to more efficiently employ aerospace forces.[2] These new AEFs will seek to provide combatant commanders with the forces they require to successfully carry out current and planned missions. At the same time the USAF will be able to respond to unforeseen emergencies as they arise. The new system seeks to address unit concerns/complaints about overwhelming operations tempos and unscheduled missions. Ops Tempo in particular is seen as a significant problem affecting an array of issues from readiness, Guard and Reserve flexibility, retention, and recruitment. Although the EAF concept is not designed to be a panacea for all USAF short and long term problems, it is clear that many are being addressed. As one of several offices concerned with implementation of the concept, the AEF Battlelab at Mountain Home AFB, Idaho, is

considering the problem from every aspect. Thus far one neglected viewpoint has been the historical basis for the AEF. They suggest similarities between current and past AEFs may be exploitable by planners. The Flying Tigers of the China Burma India (CBI) campaign, and the "Cactus Air Force" of Operation WATCHTOWER on Guadalcanal are two notable "old" AEFs. Although the "new" AEF is still in the planning stages, there have been numerous airpower organizations that were considered "expeditionary." An "expedition" as defined by Webster is "a sending forth or starting out on a journey, voyage, march, etc. for some definite purpose, as exploration or battle."[3] Clearly most, if not all, military movements from garrison to battlefield in wartime are expeditionary by definition, but by connotation the element of speed is understood. Marines have always referred to themselves as expeditionary fighters, perhaps because of their order of arrival in theaters of war. Being fastest and first to get to the action have been hallmarks of Marine Corps deployments. A newer definition of the expeditionary armed forces which is essentially the same but with a greater emphasis on speed comes from Maj Scott Moore, USMC: "Expeditionary operations comprise those military campaigns undertaken short of war for specific political purposes, usually limited in scope, with little or no advanced warning or planning, and involving the use of rapidly deployed forces from outside the theater of operations."[4] Moore splits out the concept "short of war," even though WWII was generally regarded as a total war. He also includes "no advanced warning or planning" in his definition. The new AEF stresses planning, so his definition doesn't quite fit. Regardless, it is a working definition that comes very close to describing both old and new AEFs.

The first consideration when comparing the old and the new, is whether there is any basis for comparison. In other words, are they alike enough to compare? In the case of the WWII AEFs above, they differ considerably in detail from the new EAF concept but have in common moving land-based air from the U.S. to an area of responsibility (AOR) generally near the front. This movement was typically in response to enemy action or threatened enemy action. In most cases it was associated with some kind of land force. In nearly all cases, the time between deciding to send forces and the desired arrival of the units in theater was very short. Long term resupply required ships when dealing with overseas locations. Both old and new AEFs deal with technologically advanced machinery requiring periodic maintenance. Normal wear and tear, accidents and combat, both then and today, generate the requirement for maintenance and spare parts as well as replacement aircraft. The aircraft in both instances expend resources such as fuel, oil, oxygen, bullets and bombs. Lastly, the care and feeding of officer and enlisted personnel is a time-spanning concern easily as applicable today as it was in 1942. These are areas old and new have in common.

During WWII, a real sense of urgency under the pressure of war compelled these early AEFs to make rapid decisions about every aspect of their deployments. Little time was available for planning. Indeed, entire units were sometimes unsure of where they were going until aboard ship enroute to the destination. Many of these same units had only been in existence a few weeks or months before they deployed. In some cases the airplanes they trained with were not the airplanes they were issued for combat. These are clear differences between old and new.

Evolutionary and revolutionary progression in military affairs since World War II (WWII) has alleviated some of the oppressive burdens once faced by our predecessors. Today, AEF planning revolves around operational and logistical organization, but the issues of who to send to what theater, what the proper "mix" of aircraft types should be for existing deployed locations, how they will get there, and how they will be supplied are common to both new and old AEFs. The difference is that the new AEF developers have time to adequately plan and, at least in the case of Guadalcanal, WWII planning staffs generally didn't. The AEF options are much greater today, not just because of greater aircraft capability or numbers, but because today we aren't at war. Full-scale war or two major regional conflicts do not come under the umbrella of the EAF concept, although even that idea is gaining in popularity. Deploying AEFs early, well before the requirement for a "halt" phase, will ostensibly prevent such an occurrence. In a recent RAND study by Kelley and Kamiya, a hypothetical AEF composed of 12 F-15E, 12 F-16 B40, 6 F-16 HTS, and 6 or 12 B-1s could be used, in support of existing Southern Watch units, to effectively halt an Iraqi drive into Kuwait without resorting to ground fighting.[5]

However, getting to a "hot spot" with just the right force and fighting upon arrival are well within the logistical capacity of the EAF scheme. For expeditionary "air" forces today, the ability to move aircraft and men from continental United States (CONUS) bases to anywhere in the world with aerial refueling is a profound change from the days of the Cactus Air Force. To begin with, transoceanic flights by fighter aircraft in the 1930's and 40's were rare. Typically these smaller, shorter range planes (certainly before the fielding of "long range" P-38s and P-51s) were transported by ship. This meant weeks at sea for some flying units, hardly a "speedy" arrival compared to current

capabilities. For the time, it was all they could do. Speed was generated by curtailing training or sending pilots to the theater with only the rudiments of flying training under their belts. Logistic decision-making processes were truncated by the expedient of hauling everything the squadron possessed rather than winnowing out the useless from the essential. In fact a few units were "plussed-up" with useless gear. In the case of the 67th Pursuit Squadron, uncertain knowledge of their ultimate destination due to strict operational security forced them to prepare for winter and summer combat. As a result, winter clothes arrived in the tropics as well as vital combat gear. The rush to simply get there caused some serious maintenance and logistics shortfalls described in Chapters 3 and 4. Today's USAF squadrons are capable of mobilizing in only a few days and actually deploying to crisis situations in Asia from CONUS in less than four days from a movement order. The EAF concept will attempt to better that accomplishment by having units flying combat sorties within 48 hours of notification. This optimistic goal firmly puts the notion of speed in current AEFs.

In the past, the great unknowns presented to a nation unprepared for war led to halting experimentation which occasionally flopped. The military learned painfully slowly how to deal with problems and made attempts, on the fly, to codify lessons learned so every operation wasn't a premiere event. This tendency has matured to the stage where the USAF now aggressively sifts historical precedent to save time, money, and lives. As a learning tool, this paper offers a critical look at important issues both then and now. This paper will also focus on one specific historical AEF, the Cactus Air Force, and will compare the issues of training, maintenance, and logistics to the new EAF concept, placing particular emphasis on the air forces on Guadalcanal.

Notes

[1] Oral History Interview of Major John Smith, USMC, Commanding Officer VMF-223, in the Bureau of Aeronautics, 10 November, 1942, (180.451-1, 1942-43, in the USAF Collection, AFHRA), 9.

[2] There is some confusion regarding the use of the acronyms EAF and AEF. Currently the concept and mindset of expeditionary forces is referred to as EAF. The actual units to be formed are AEFs.

[3] *Webster's New World Dictionary, Second College Edition*, (Cleveland: William Collins + World Publishing Co., Inc., 1978), 493.

[4] Moore, R. Scott, Maj., "Looking Back at the Future: The Practice and Patterns of Expeditionary Operations in the 20th Century," (*Marine Corps Gazette,* August 1993), 74.

[5] Kelley, Charles T. Jr., and Kamiya, Eiichi, "Contribution of an AEF to a SWA Contingency: The Basra Breakout," (*RAND Annotated Briefing*, June 1998), 5.

Chapter 2

Training

> *Air battles are won by hitting enemy planes with bullets. This simple fact is often overlooked by people who are responsible for the over-all training because it's crowded out of the picture by all the other things they have to do. But that, after all, is the primary mission and unless a fighter pilot can use his primary weapon, his guns, he's of little value. A fighter pilot must be expert with his fixed guns. He has so little time to do his work he can't afford to miss. This was brought out in every battle we fought. These battles have been won, in my opinion, by the skin of our teeth. It was always like a close baseball game - anybody's game until the 9th inning.*
>
> —Lieutenant Commander John S. Thach

It is tough to characterize old AEF training in that the flyers on Guadalcanal consisted of Marine, Navy, and USAAF pilots from widely varied backgrounds. The skill and experience of carrier pilots, when they finally began trickling in to Cactus, was generally higher than the first arrivals due to the combat experiences of Midway and Coral Sea. Much to their displeasure, many carrier-based squadrons found themselves flying as a part of Cactus Air Force when their "home" carriers were either sunk or damaged. The first three original squadrons included Marines' VMF-223, VMSB-232, and the USAAF's 67th Pursuit Squadron. The training and readiness of these units is of particular interest since they were the first to arrive almost devoid of combat experience.

VMF-223 was commanded by Maj. John Smith. The unit originated in May 1942 as a part of the general build up for the war and consequentially had only been in

existence for a short time when Smith took control of it.[6] Smith, a former ground officer who became a dive-bomber pilot, had only transferred to fighters a few months earlier and now was tasked with commanding a squadron. At Ewa Field in Hawaii he had only a few weeks to train his men for battle.[7] As Smith reported in a 10 Nov 1942 interview, "It was a brand-new squadron."

> We got eighteen F4F's - finally - for this special mission---to support the First Marine Division, as it turned out later. We didn't know where we were going or with what outfit, at that time. We'd had from eight to ten Brewsters [Brewster Buffalo trainers] before that to train with, and eight or ten pilots. All of a sudden we got eighteen F4F's and twenty-one pilots, and had the maximum of six weeks to train.
>
> In the six-week period, which was the maximum period, we all had to qualify on an aircraft carrier, which we did. We spent as much time as we could flying on Saturdays and Sundays and every other day, doing gunnery and dummy runs and anything that would help give people quick experience, or quick training. And it was the first experience that I've ever had at trying to train anybody, but it seemed to me that gunnery was the most important thing, not only from the pilot's standpoint, but from the ground standpoint, that is, the gunnery department in a squadron. So we concentrated on gunnery more than anything else, which was a good thing after we found out where we were going.[8]

VMSB-232, established at the same time as VMF-223, was commanded by Major Richard Mangrum who was in nearly the same shape in terms of experience. He had ten brand-new pilots "most of which had never dropped a bomb."[9] Unfortunately, from a consistency standpoint, Smith and Mangrum did most of their training in planes that they would not be taking with them. "Just before sailing on board the escort carrier *Long Island* on 2 August for Guadalcanal, Smith's squadron received brand-new F4F-4's with two-stage superchargers." "Mangrum's squadron turned in its old SBD-2's, which had been reconditioned after seeing their best days in the Coral Sea battle, and was furnished with SBD-3's which had self-sealing tanks and armor plate."[10] Apparently the lack of

training was addressed while embarked on the *Long Island*. "The naval officer commanding Task Group 2.6 radioed on the 13th that the pilots in *Long Island* required additional carrier and combat training before they could be considered efficient fighting units." Rear Admiral John S. McCain, Commander Aircraft South Pacific Force (ComAirSoPac), who had operational control of all land-based aircraft in the South Pacific Area, decided to swap out the most inexperienced pilots from Smith's squadron for the better-trained pilots of Major Bauer's VMF-212 on Efate. All that was required was a brief stop at Efate to make the exchange which they did on 14 August.[11] On 20 August, the men of Smith's and Mangrum's squadrons were catapulted off the short deck of the *Long Island* bound for Guadalcanal some 200 miles away. Although none of the pilots had ever been catapulted before, everyone made it off without mishap.[12]

The level of training of the 67th Pursuit Squadron prior to leaving CONUS enroute for New Caledonia also left much to be desired.

> In pilots it had three veterans, trained in pursuit at Selfridge Field, who had been with the squadron almost since its inception in September, 1940. They still held the rank of Lieutenant. It had 18 more, fresh from flying school, who had been added several weeks before the squadron left Baton Rouge Air Base for overseas duty, shortly after Pearl Harbor. It had seven more green ones added at the Brooklyn Port of Embarkation. Finally, it had fifteen more picked up in Australia who had put in about 50-hours apiece flying P-40's cross-country around Australia.[13]

Like the marines, the airplane they practiced in was not the one they took to the war. On the docks at Noumea, New Caledonia there "were 45 P-400's and 2 P-39's, unassembled and in crates." "Only two of the 67th pilots had ever flown a P-39," and none had flown the P-400.[14] After the incredible odyssey of getting all of the planes to Tontouta Air Base 35 miles away, over unimproved mountain roads, and putting the

planes together with no instruction manuals, the squadron was faced with the task of getting everyone trained to fly them.

> There were no poop sheets to read; experience was handed down by Lts. Brannon and John A. Thompson, the two pilots with P-39 experience. Most of the others were recent flying school graduates with very few hours in hot pursuit planes. Furthermore they had not had a hand on any throttle for two and a half months, since they left Baton Rouge. But only one serious accident resulted during the check-out flights. One green pilot tried to go around after a bad landing attempt, let the torque get away with him, and went roaring through the trees bordering the runway, cutting a path 100-yards long. He stepped from the wreckage uninjured, and was promptly made Air Corps Supply Officer, with the salvageable parts in the wreck as a starter.[15]

They were only learning the very basic operations of their plane. They still had to hone their skills as interceptor pilots in this new aircraft. Meanwhile, the residents of New Caledonia were expecting a visit from the Japanese any day and the men of the 67th Pursuit Squadron were supposed to be their defense. They were able to train in the basics on their own but they lacked combat proficiency, especially gunnery skills.

> There were no sleeves, or tow targets, with which to practice aerial gunnery. So the 67th negotiated a deal with VMF 212 stationed on the island of Efate, in the New Hebrides, for an exchange of pilots. A total of 12 of the 67th's pilots flew their airplanes across 325 miles of water to Efate, in batches of four a week for three weeks, while the Marines brought their Grummans to New Caledonia. The old P-400's followed the Wildcats in dives, dogfights and in which the Marines patiently taught the Army pilots their technique of overhead and high-side passes. They taught them how to estimate speed of a moving target, how to lead him into the gunsight and how to shoot with deadly accuracy. Many warm friendships developed which were to be renewed later when the 67th flew with VMF 212 at Guadalcanal.[16]

In conjunction with the combat training these Army pilots were getting, they routinely made discoveries about the flight envelope of their new plane. Many published operations limitations were amended as a result of this experimentation and several more underestimates of aircraft performance would be uncovered on Guadalcanal.

The executive officer of MAG 23, and the commander of MAG 14 were interviewed in the Bureau of Aeronautics in Washington, D.C. subsequent to their tours on Guadalcanal. Each had criticisms of the level of training the pilots had when they arrived in theater. Lieutenant Colonel Fike of MAG 23 specifically pointed out that many pilots had poor navigation or instrument flying skills. He continued,

> When I say poor navigation, I mean that the navigation problem became so involved that it was one that they were unable to cope with. They may have been good navigators, too, but there are often many other influencing factors. I know of about 4 or 5 planes that were lost due to poor instrument flying. Most of the pilots operating down there are very young; they've been hurried through training; most of them have had 8 or 10 hours of instrument work and very little real instrument flying under actual bad weather conditions.
>
> Instrument flying could be given more attention with profit if the time element in our big program permitted.[17]

In addition to the problems with navigation and instrument flying identified by LtCol Fike, Colonel A. D. Cooley of MAG 14, found many other training issues to critique. Commenting in May 1943, Col. Cooley said:

> In the way of training, it was unfortunate that the group then at Guadalcanal and the other first arrivals had very little preparation before going into combat. We didn't really have the right to expect too much from them.
>
> The first and most important thing was the unfamiliarity of pilots and radio gunners with their equipment.
>
> I found people who were not familiar with their guns, men actually ready to take off in combat who didn't know how to shoot; they didn't know how to work the landing gear of the airplanes; they knew nothing about the safety devices in the plane. Some of them had had very little familiarization in the type of plane they went into combat with. Navigation just didn't exist; they either got back by piloting, or they didn't get back. They had no idea of tracking or plotting their courses out, or working their navigation. If any of them got lost or got in bad weather, it was just chance that they got back; and a lot of them didn't. Night flying - they had practically none.

He covered night flight, instrument flight, air discipline, and equipment knowledge as areas needing considerably more training. He concluded his diatribe by saying, "I've probably talked too much on this matter of preliminary training. Perhaps it's being taken care of here; I don't know. But it is so important that somebody should take it seriously. They'd get a lot better results from some of our operations had the crews had merely the elementary training required to operate their equipment."[18]

Lt Harold Larsen, skipper of VT-8 spent time on Cactus after his carrier *Hornet* was sunk in the Battle of the Santa Cruz Islands on 25 October 42. He was critical of pilots' lack of training in ground target identification and the use of the coordinate system to find targets. The risk of not knowing this skill is that "you may end up bombing your own troops!"[19] For Cactus Air Force pilots, training in multiple important skill areas would have to come on-the-job, in combat, in miserable surroundings, with limited rations, and in a state of sleep deprivation. Clearly the odds were not favorable. By comparison, the new AEF stands little likelihood of ever being in this situation.

The aircrew of today's fighter squadrons are held to a very high standard before they are considered "mission ready" or MR. The amount of training received varies with each specialty and aircraft, but the individual and squadron skills are well honed before any would be pushed into combat. However, it is safe to say that in wars ever since there hasn't been the same sense of urgent pilot need that WWII occasioned. Force levels today reflect planning for two major regional conflicts (MRCs) occurring nearly simultaneously. It is conceivable, but improbable, that an enormous number of aircrew would need to be produced quickly. For that reason current training regimens might be curtailed, but the possibility of an AEF squadron receiving totally different aircraft *just*

before or upon arrival in a theater of combat is nil. The type of training shortfall the new AEF may encounter is coordination with the units within the AEF. In the latest proposal, several squadrons of various types will allocate assets to AEF service. The AEF force structure, once agreed to, will need to come together periodically as a unit to practice teamwork. This training event will probably precede deployment by a month or two and could take the form of an "AEF-Flag" at Nellis AFB. Units assigned to each AEF will remain constant over time allowing only for small changes as new technologies and capabilities come on line. Gen. Ryan has referred to this as building "habitual relationships." This will help mutual support considerations tremendously, especially if the units deploy regularly to the same location year after year as the US has done to Southern and Northern Watch. Given that the force is being designed to allow last-minute alterations of force structure, all assigned AEF units will need to be included in the spin-up training. This will prevent AEFs deploying with completely new, untried force arrays, without previous large-scale training.

Unit integration training such as the AEF-Flag was common among Navy units in 1942, but was new to the multi-service Cactus fliers. For the first units to arrive at Guadalcanal, because they had limited practice, they worked to improve coordination. These early attempts at joint operations eventually managed to work well regardless of the initial low experience level of the participants.

Notes

[6] Frank, Richard B, *Guadalcanal*, (New York: Random House, 1990), 139.

[7] Miller, Thomas G. Jr., *The Cactus Air Force*, (Fredericksburg: Admiral Nimitz Foundation, 1969), 21.

Notes

[8] Oral History Interview of Major John Smith, USMC, Commanding Officer VMF-223, in the Bureau of Aeronautics, 10 November 1942, (180.451-1, 1942-43, in the USAF Collection, AFHRA), 1-2.

[9] Frank, 139.

[10] Sherrod, Robert, *History of Marine Corps Aviation in World War II*, (Washington: Combat Forces Press, 1952), 73.

[11] Sherrod, 77-78.

[12] Miller, Thomas G. Jr., 25.

[13] Dillon, Lt Barclay, Jr., *History of 67th Fighter Squadron, parts II, III, and IV,* (SQ-F1-67-H1, 16 Jan 41 - 31 Dec 43, in USAF Collection, AFHRA), 10.

[14] Dillon, 10.

[15] Dillon, 14.

[16] Dillon, 20.

[17] Oral History Interview of Lieutenant Colonel Fike, USMC, Executive Officer Marine Air Group 23, in the Bureau of Aeronautics, 4 December 1942, (180.451-11, 4 December 1942, in the USAF Collection, AFHRA), 8.

[18]Oral History Interview of Colonel A. D. Cooley, USMC, Commanding Officer Marine Air Group 14 - Guadalcanal, in the Bureau of Aeronautics, 17 May 1943, (180.451-23, 17 May 1943, in the USAF Collection, AFHRA), 1-2.

[19] Oral History Interview of Lieutenant Harold H. Larsen, USN, VT-8 USS Hornet, in the Air Information Branch, Bureau of Aeronautics, 18 January 1943, (180.451-19, 18 January 1943, in the USAF Collection, AFHRA), 8.

Chapter 3

Maintenance

> *Radio communication with planes on patrol gave rise to another problem - the channels used by the Army planes differed from those used by the Navy, and the Army planes could not receive Navy traffic. This matter was resolved by using the radio from a grounded P-400 - twin microphones were rigged so that messages could be sent simultaneously to all planes.*
>
> —Major John L. Zimmerman, USMC

Maintenance was a considerable problem for the Cactus Air Force compounded by the almost total lack of parts and spares. Although the Marines were flying off of *Long Island*, all of their ground support and most of their supplies were aboard *USS William Ward Burroughs.* Until they arrived, "the absence of trained ground crews would make it impossible to operate the fighters and dive bombers."[20] From their arrival on 20 Aug 1942, the Marine pilots would be faced with servicing and repairing their own airplanes. They were assisted in this by a unit called "CUB-1." These units were the brainchild of planners in Washington who envisioned "the need for specially equipped units to create advanced bases. They organized detachments code-named 'Lions' for large advanced bases and 'Cubs' for intermediate fuel and supply bases."[21] Admiral McCain solved this problem "thanks to the presence of CUB-1 on Espiritu Santo." He ordered the movement of the "aviation component" of this unit to Guadalcanal. With that order, five officers and 118 enlisted men, still in the process of unloading their gear *onto* Espiritu Santo, then

shipped out for Cactus.[22] These units were never intended to be aviation ground crews, but they were the only hands available and were put to back-breaking use.

> All refueling had to be accomplished by using hand pumps stuck directly into standard 55-gallon gasoline drums. Rearming of the SBD's had to be done by laboriously manhandling 500-pound and 1000-pound bombs since there were no bomb-handling trucks, bomb carts, or bomb hoists on the island. The enlisted men of CUB-1 had had something less than four months' service and had to be constantly and minutely supervised by their commanding officer, Ensign George Polk.[23]

Maj. Smith of VMF 223 commented on this unit's activity: "When we first got there the Navy CUB unit did all of our plane servicing, that is, just gas and oil the planes. We didn't have any trouble with the planes because they were brand new, …and I might add that the CUB unit that was there, most of those people had never seen an airplane before, especially an F4F, but they did an excellent job in taking care of us until our men got up there."[24] Their own ground crews showed up on 29 August, but they were woefully undermanned. LtCol Fike explained: "Our group organization was, by the tables, supposed to muster about 1700 men – we went down there with actually about 800, so you can see we were very shorthanded."[25] Lt Larsen believed his men should have a better knowledge of basic servicing but was bothered that so many didn't.

> Pilots, as a rule, don't even know how to gas their planes, let alone put in fuel, or oil, or how to make a minor repair, such as to put a piece of scotch tape over a hole in the leading edge of a wing…damn few pilots know how to prepare their own airplanes. You get almost any group of pilots and ask them to go over and gas their planes, and they'll just about go crazy trying to find the gas tanks.[26]

The criticism expressed by Larsen can be appreciated from the viewpoint of a squadron commander exhorting his pilots to do things they were untrained for, and that would necessarily help send them back into combat. But there were numerous accounts of pilots belting ammunition for their aircraft machine guns because there simply weren't

enough people to get the work done as quickly as it needed to be done. The "wrench turners" bore the brunt of the manpower shortage. "Ground crews labored long and hard with primitive equipment in their efforts to maintain the aircraft in flying condition; no free time remained for them to spend improving their own living quarters-fourteen hours per day measured an average stint and a sixteen-hour stretch was not unusual."[27]

> For the ground crews of the 67th living on the target, the work load and environment were wearing and the schedule left no time for real rest. Working on the aircraft to keep them flying by daylight, and often volunteering to augment the Marines to man forward listening posts at night when a Japanese breakthrough seemed imminent, there were not enough of them for this kind of combat maintenance. Their tools were limited and there were few new spare parts. Parts taken from a wreck involved double work---retrieving the part from the wreck and then installing it on an out-of-commission plane.[28]

While plane mechanics in 1942 had a tough time of it on Guadalcanal, the personnel today would concede that their jobs are considerably easier.

The new EAF articles and operational concepts do not cover maintenance in detail. There have been ideas proposed by numerous USAF leaders over the past few years admitting to a need for reducing the total "footprint" of the AEF -- in other words, reducing the amount of airlift by reducing the amount of "stuff" brought along in support of the unit. By chopping manning to the absolute smallest numbers and designing follow-on air assets to use only one kind of ground support equipment (GSE), limited cargo space is opened up for other critical items like weapons. A popular idea in USAF doctrine is "reachback," whereby an air bridge to the source of supply/maintenance (presumably back in the US) will provide the forward unit on demand as opposed to supplying all potential needs up front. The deployed AEF, finding itself in lacking some unforeseen critical item will depend on reachback to get it.

The *USAF Scientific Advisory Board Report on USAF Expeditionary Forces* (hereafter USAFSABR) published in November 1997 listed a number of recommendations for the air staff. Among them was the implementation of "Minimum Flight Essential Maintenance" concept which dramatically reduces the AEF maintenance burden. Another consideration planners are looking at is, once the new smaller, lighter, multi-aircraft compatible GSE is fielded, simply leaving it at forward bases as prepositioned maintenance equipment. Already, units have deployed to Jordan with fire-fighting equipment and simply left it there for Jordanian Air Force use and upkeep. Future Jordan-based AEFs will have ready access to this equipment without the logistical burden of getting it there. The range of consideration runs from easy and feasible to hard and impossible. While the concept is in development, *everything* is fair game.

Aside from "pie-in-the-sky" dream desires, the jets we use today are orders of magnitude more complex than the aircraft built in WWII. F-15's and F-16's and most newer airframes were conceived with "black-box" maintenance in mind. Easily replaceable unitary parts and systems have become standard in the USAF. These innovations have been the windfall of years of cost-saving efforts aimed at reducing the necessity of high-level repair technicians in the field. Still, given that lighter is better, cheaper, and faster, the drive to scale down maintenance infrastructure will be a continuing focus of AEF planners.

Notes

[20] Zimmerman, Maj. John L., *The Guadalcanal Campaign,* (Marine Corps Historical Monograph, Washington, DC: US Government Printing Office, 1949, Reprint, New York: Greenwood Press, 1969), 64.

[21] Frank, 137.

[22] Zimmerman, 64.

Notes

[23] Miller, Thomas G., 28.

[24] Oral History Interview of Maj John Smith, 2.

[25] Oral History Interview of LtCol Fike, 19.

[26] Oral History Interview of Lt Larsen, 3-4.

[27] Craven, Wesley Frank, and Cate, James Lea, eds, *The Army Air Forces in World War II, Volume Four, The Pacific: Guadalcanal to Saipan, August 1942 to July 1944*, (Chicago, IL: The University of Chicago Press, 1950), 41.

[28] Ferguson, Robert Lawrence, *Guadalcanal - The Island of Fire: Reflections of the 347th Fighter Group,* (Blue Ridge Summit, PA: Tab Books, 1987), 125.

Chapter 4

Supply and Sustainment

> *The existing deficiencies which come to mind are, first, the lack of aircraft operating spares, particularly accessory spares. Time after time we've had planes swinging around a buoy or on a field that couldn't operate because we didn't have some very minor accessory part that we couldn't provide in any way.*
>
> —Captain M. B. Gardner, USN

A case can be made that the most critical problem facing the Cactus Air Force was one of supply and sustainment. The supply function was originally the responsibility of the Navy who was tasked with initial supply and sustainment of all units participating in the Solomons. Problems developed early on as a result of numerous failures. The main unit in the assault on Guadalcanal was Maj. General Archer Vandegrift's 1st Marine Division (1st MarDiv). When they arrived in New Zealand 10 days before D-day, the Marines found themselves in the unfortunate position of having to completely unload then "combat load" the ships. Combat loading refers to loading ships with the most critical items last and the least critical items first. It improves the likelihood that really important supplies will actually make it to the combat zone.[29] For 1st MarDiv this was accomplished under the worst possible conditions resulting in mistakes being made along the way.[30] Gen. Vandegrift's final report highlighted many suggestions for improvement in the entire process. Admonitions as seemingly obvious in as "No supplies should be

packed in pasteboard containers," and many other lessons were clearly learned for the first time. Vandegrift enumerated numerous problems with supply, but the foreshortened schedule he had to live with was the worst limitation. Lack of time prevented him from training his troops to deal with the amphibious landing of equipment and supplies.[31] The gear that came ashore had to be manhandled from boat to beach. The manpower shortage due to this limitation kept the supplies from moving off the beach and into supply dumps for days. This plum target was fortunately left untouched by the Japanese, but could have led to disaster if it had been destroyed. The supply situation was further exacerbated by the early departure of the support ships prior to the complete offload of the Marines' supplies. At the ships' departure, only about half of the Marines' gear had been delivered to the beach.

The minimum essential supplies required to operate *aircraft* weren't coming in with the 1st MarDiv. These were aboard the *USS Burroughs* (which also carried the ground crews for the Marine squadrons coming to the island). Delays in the *Burroughs'* arrival forced some alternative plans. The CUB-1 unit ordered to come early to provide the manpower for aviation ground duties would bring supplies with them using the destroyer transports *Colhoun, Gregory, Little,* and *McKean*.[32]

> The total supply carried northward (from Espiritu Santo) by the four craft included as principal items 400 drums of aviation gasoline, 32 drums of aviation lubricant, 282 bombs ranging from 100 to 500 pounds, belted ammunition, and miscellaneous critically important tools and parts. The men carried only light packs and arms only---it was thought that rations, mess and organizational equipment, medical supplies, and tentage could be supplied by the 1st Division quartermaster.[33]

Along with this supply, there were 400 drums of fuel left behind by the Japanese when the Marines first came ashore. So the operation began with 800 drums of fuel. As

a point of reference, one drum of aviation fuel roughly corresponded to one hour's flying time for an F4F-4. When planes were finally on the island the gas supply dwindled rapidly for a variety of reasons other than outright destruction by the enemy. During enemy air attacks, fighters were naturally sent up in defense, but they couldn't always keep enemy bombers from hitting the field. Consequently, bomber and scout aircraft were flown out to prevent them from being bombed on the ground, but in doing so, consumed many precious drums of fuel.[34] The Japanese attacked practically every day, and sometimes twice a day, so sortie generation took its toll on the fuel supply. This beginning fuel supply was augmented by numerous resupply attempts over the course of the next four months, but not all of them were successful due to the efforts of the Japanese to interdict shipping. There were times when no transports could make it to the island. Col. Cooley remembered, "In one period of five days all the bombs and gasoline we got came in by Marine Air Transport."[35]

Captain Gardner, Chief of Staff for Adm. McCain, summed up the unique conditions faced when trying to start and run an operation in the South Pacific.

> The problems that arise are, first, habitation and food for the personnel; there is nothing there - everything they eat, everything they wear, every place they live has to be brought in from the United States. There is no such thing as living off the country in the South Pacific, unless you live on cocoanuts [sic] alone. The unloading of ships with operating supplies is a tremendous problem – there are no dock facilities, no pier heads, cranes, and, in general, there are very poor landing beaches for landing craft. The question of motor transport - everything that you haul to the beach must then be dispersed in supply dumps under the trees out of sight, to avoid being destroyed by enemy bombing. The question of construction equipment, such as bulldozers and carryalls - they must be brought ashore so that you can build your roads, so that you can build your field, and all the other facilities which must be built. There is nothing to start with, except the jungle.

> Gasoline and ammunition must be brought in and at the kickoff, at any rate, at an advanced base all gas must be handled in drums. Everything is manhandled and that requires tremendous manpower, and the manpower you use, in turn, requires supplies just for their living, so that some balance has to be struck. It's quite conceivable that you could have so many men to do the work that the transporting of supplies for their actual living brings you to a point where the law of diminishing returns sets in.
>
> Against this time is always the essential factor. We never seem to go into these things until the eleventh hour, and then everything must be done yesterday![36]

Until Maj. General Millard F. Harmon filled the newly created position of Commanding General of U.S. Army Forces in the South Pacific Area (COMGENSOPAC) on 7 Jul 42, the overall supply situation in that region was confused and inefficient.

> As late as the end of May, naval authorities possessed no information as to how the War Department intended to administer the forces in the South Pacific or what agencies were responsible for supplying them. Admiral Nimitz, Commander in Chief Pacific Fleet (CINCPAC), had received requests for supplies for Army forces, but in the absence of information he had merely passed these pleas on to the Navy Department.[37]

Harmon's mission was the training and administration (technically to include the supply function) of all air and ground units in the South Pacific.[38] Harmon knew he was subordinate to Adm. Ghormley, Commander South Pacific Ocean Area (COMSOPAC), and also knew that he needed to maintain a good working relationship due to the fact that "the Navy retained responsibility for providing Army units with aircraft components and parts…"[39] His command, U.S. Army Forces in the South Pacific Area (USAFISPA), began displacing from the Navy the administration of Army units in July, "but Harmon had to wait until 15 October before he finally could assume complete control over tactical, administrative, and supply functions."[40] Supply operations were naturally dicey under fire on Guadalcanal, but supply problems existed all along the route. The need for

enormous quantities of supplies produced a profound shortage of shipping and Captain Gardner previously described the lack of materiel handling capacity in the South Pacific area to handle the traffic that was pouring in. The forward area ports that were staging areas for runs into the combat zone were unprepared to deal with the volume. According to Craven and Cate in *The Army Air Forces in World War II*, there were two parts to the problem. The first was getting materiel to the forward area, off the transports and onto the beach. The second was finding a place for it once it hit the beach. Noumea was a case in point. "It was not uncommon to find twenty to thirty cargo vessels lying in the harbor and at times the number rose to seventy or eighty; moreover, some of them lay at anchor more than three months before they could move alongside a dock." Some ships showed up with cargo units that exceeded the capacity of the cranes at the docks.[41] As time progressed and facilities were built, the supply shortage slowly diminished at forward locations like Guadalcanal. Early in 1943 the situation was largely under control. The modern AEF will also have to bring supplies wherever they are sent, but that is the only common ground between old and new.

The main difference between then and now is adequacy of time. Plans are already being considered for nearly every eventuality and crisis planning can adjust plans as necessary to fit peculiarities. The plans for the Guadalcanal operation were put together from scratch in five weeks. The new AEF won't have an infrastructure problem either. As Gen. Looney has mentioned, the AEF will probably only deploy to established airfields where fuel storage, water availability, and prepositioned ammunition already exists. In other words the USAF would more than likely go where it has gone before.[42] The prodigious difficulties arising from deploying to an actual "bare base" just about rule

out that from ever happening as a part of the EAF concept. More than likely, the AEF will not be bedded down on a field subject to direct enemy fire either. As with maintenance, critical parts and ammunition that aren't already in theater will be flown in using reachback. Additionally, the USAFSABR recommends continued funding for the development of smaller, more effective munitions to limit the total number of airlift sorties required to keep AEFs supplied. The new EAF concept will rely on "agile logistics" and "pull-demand." Thus, the AEFs shouldn't have to deal with any of the Cactus Air Force's problems of supply and sustainment.

Notes

[29] Karig, Walter, Captain, USNR, and Purdon, Eric, Commander, USNR, *Battle Report, Pacific War: Middle Phase,* (New York: Rinehart and Company, Inc., 1947), 75-76.

[30] Zimmerman, 20-21.

[31] Commanding General, First Marine Division, Fleet Marine Force, *Final Report on Guadalcanal Operation*, (180.1-1, pt 5, 19 Sept - 9 Dec 42, in the USAF Collection, AFHRA), 1-11.

[32] Morison, 67.

[33] Zimmerman, 64.

[34] Oral History Interview of Colonel A. D. Cooley, 6.

[35] Oral History Interview of Colonel A. D. Cooley, 4.

[36] Oral History Interview of Captain M. B. Gardner, USN, Chief of Staff, ComAirSouPac, in the Bureau of Aeronautics, 13 January 1943, (180.451-18, 13 January 1943, in the USAF Collection, AFHRA), 2-3.

[37] Craven, 32.

[38] Craven, 30-31.

[39] Craven, 32.

[40] Craven, 33.

[41] Craven, 74-75.

[42] Looney, William R. III, Brig Gen USAF, "The Air Expeditionary Force: Taking the Air Force into the Twenty-first Century," (*Airpower Journal*, Winter 1996), 7.

Chapter 5

Conclusions

> *I don't know whether you'd say this was a tactical lesson, but there was one lesson that I learned in the Guadalcanal operation, and that is that you're not licked until you admit yourself that you are licked. I think that, viewed dispassionately, there were at least three occasions when the chances of our holding Guadalcanal were not worth five cents. <u>But the Marines on Guadalcanal didn't figure that way, and we still have Guadalcanal!!</u>*
>
> —Captain M. B. Gardner, USN

The difference between losing and winning may have a lot to do with attitude as Gardner suggests, but factors such as training, maintenance and logistics play a huge role in maintaining that attitude as well as giving men the tools they need to complete their missions. Modern AEF organizations have come a long way towards eliminating nearly every single problem faced by the men on Guadalcanal comprising the Cactus Air Force. AEFs are not designed for major regional wars, much less world wars. They are being created, among other reasons, to prevent wars from developing. If a war starts, the AEF planning is dropped and an appropriate CinC OPLAN is selected to deal with it.

Our new AEFs, replete with plans, materiel, modern aircraft, and worldwide rapid deployability, will be a formidable weapon. If they are in the same frame of mind as the heroes of the Cactus Air Force in 1942, any mission they take on will be a success. The following account describes the Cactus mindset.

The 67th Pursuit Squadron faced sheer misery when they arrived in Noumea to establish themselves at Tontouta Airbase. Their planes arrived on the docks in the form of forty-seven 10,000 pound crates which somehow had to get to the base 35 miles away. Once on base, the squadron had to put the planes together without benefit of an instruction manual for the P-400. In the words of veteran Army Master Sergeant, Robert Foye:

> Assembly rig built from old timbers picked up around Tontouta. Mechanics had only the simple 1st Echelon maintenance tools and only about 10 kits of these for the entire squadron. No special tools of any kind. Even the truck tools were at a premium.
>
> No replacement parts. Every fifth ship was designated "spare parts" before it was uncrated.
>
> Rain, mud, and mosquitos. Mechanics worked sopping wet. Pvt. Jones worked on tail assembly sitting in six inches of water, so wet from rain he never knew the difference. Rain poured down their faces and necks – still they worked on, passing the scanty wrenches from one to another. Not a growl from any man.
>
> Work day was from 5 A.M. until dark. Cold (sometimes hot) chow at noon, and back to work right away. No transportation during the first five days and men had to walk two miles to work and home again through the mud.
>
> No TECHNICAL ORDERS or MANUALS of Instruction but started producing airplanes at the rate of 1.5 a day after the first week.
>
> Frequent troubles. One prop was missing from crate. Sometimes vital fuel and pressure lines found to be mysteriously plugged with scotch tape. One airplane had electrical circuits hooked up at the factory evidently by a maniac. Press, and wheels would retract. Press wheel switch flap switch and the guns would fire. Took days to straighten things out. Promptly named the planes Rube Goldberg Special.
>
> Mechanic became production - conscious and still section chiefs would urge them on. Assembly run like a factory – all in the open and in the mud. Would put any depot to shame, with Initial Assembly, Empennage Section, Wing Section, Engine Run-In Section, Rigging Section, Radio Installation Dept., Armament Installation Dept., then Final Inspection

> Dept., and Test Flight Section. Every man to his job, and never a growl except when one section chief would hold up another, "come on!, this is war. Keep "em rolling."
>
> From crate to flying in one day. Thirty airplanes assembled by the 67th – which was not equipped or required to do the work – and 11 by the 65th Material Squadron. All in 29 days, and in 20 years in the Army I have never seen it done before.
>
> One mechanic (Hatfield) improvised tools by cutting wrenches and welding on extensions. Servicing funnels made from gallon cans with make-shift spouts soldered to the corners. (Incidentally, 67th should have patent on the gas drum washing rack – one drum split in half and resting on V-shaped cut in the other. Door cut in bottom half [f]or the fire. Result: A practical G.I. mess kit wash stand).
>
> During the second week of assembly, officers and men began to come down with dysentery. Men literally dropped on their knees with cramps at the rig before they would ask for relief. Had to be ordered home, sometimes even threatened with trial for disobedience of orders for refusing to leave their place on the line. Why hasn't Washington designed a decoration for men in the Air Corps who, far above and beyond the call of duty, perform feats on the ground?
>
> It would be impossible to pick out outstanding men during this period – when they worked from 5 A.M. until dark in the mud and rain and then volunteered to go back at night. The whole damn outfit was outstanding. An outfit like this could be the nucleus for six Air Corps groups and with recruit fill-ins could start operating tomorrow.…[43]

Foye captured the essence of the mission and the extraordinary personalities of those sent to do the work. It covers the issues of maintenance and supply graphically, and is typical of the performances of most of the units who suffered the privations and violence of Cactus. It is part and parcel why we won.

Notes

[43] Dillon, 12-14.

Bibliography

The AAF In The Battle For Guadalcanal, Army Air Force Historical Office, 1942. 105.1-7, 1942, in the USAF Collection, AFHRA.

Armstrong, Peter F. C., Col, USMC(Ret). "The Battle of Guadalcanal: A 50-Year Retrospective." *Marine Corps Gazette* (August 1992): 74-87.

Battle Reports of Guadalcanal Area by Captain Darrell D. Irwin, Sqdn. 224, Marine Air Group 23, and 2nd Lieut. Glenn B. Loeffel, Sqdn 231, Marine Air Group 23, 28 October 1942. Air Base Headquarters, Office of the Military Intelligence, Hamilton Field, California. 180.451-13, 28 October 1942, in the USAF Collection, AFHRA.

C.O.H.Q Bulletin No. Y/17, Lessons Learned From The Guadalcanal Operation 1942. 508.171Y-17, Dec 1942, in the USAF Collection, AFHRA.

Combat Narratives, Solomon Islands Campaign: I, The Landing in the Solomons, 7-8 August 1942. Office of Naval Intelligence, US Navy, 180.601-I, 7-8 Aug 1942, in the USAF Collection, AFHRA.

Combat Narratives, Solomon Islands Campaign:II, The Battle of Savo Island, 9 August 1942: III, The Battle of the Eastern Solomons, 23-25 August 1942. Office of Naval Intelligence, US Navy, 180.601A-II, III, 9-25 Aug 1942, in the USAF Collection, AFHRA.

Combat Narratives, Solomon Islands Campaign:IV, Battle of Cape Esperance, 11 October 1942: V, Battle of Santa Cruz Islands, 26 October 1942. Office of Naval Intelligence, US Navy, 180.601A-IV, V, 11-26 October 1942, in the USAF Collection, AFHRA.

Combat Narratives, Solomon Islands Campaign:VI, Battle of Guadalcanal, 11-15 November 1942. Office of Naval Intelligence, US Navy, 180.601A-VI, 11-15 Nov 1942, in the USAF Collection, AFHRA.

Commanding General, First Marine Division, Fleet Marine Force. *Final Report on Guadalcanal Operation*, 180.1-1, pt 5, 19 Sept - 9 Dec 42, in the USAF Collection, AFHRA.

Condon-Rall, Mary Ellen. "The Guadalcanal Campaign." *Infantry* (July-August 1993): 23-29.

Craven, Wesley Frank, and Cate, James Lea, eds. *The Army Air Forces in World War II, Volume Four, The Pacific: Guadalcanal to Saipan, August 1942 to July 1944.* Chicago, IL: The University of Chicago Press, 1950.

De Chant, John A. *Devilbirds: The Story of Marine Corps Aviation in World War II.* New York: Harper and Brothers Publishers, 1947.

Defensive Tactics Against Fighters, Fixed Gunnery and Combat Tactics Series No. 4, Issued by Training Division, Bureau of Aeronautics, United States Navy, 1943. 1943, in the USAF Collection, AFHRA.

Dillon, Lt Barclay, Jr,. *History of 67th Fighter Squadron, parts II, III, and IV,* SQ-F1-67-H1, 16 Jan 41 - 31 Dec 43, in the USAF Collection, AFHRA.

Ferguson, Robert Lawrence. *Guadalcanal - The Island of Fire: Reflections of the 347th Fighter Group.* Blue Ridge Summit, PA: Tab Books, 1987.

Fighter Escort, Fixed Gunnery and Combat Tactics Series No. 6, Issued by Aviation Training Division, Office of the Chief of Naval Operations, U.S. Navy, April 1944. April 1944, in the USAF Collection, AFHRA.

Frank, Richard B. *Guadalcanal.* New York, NY: Random House, 1990.

Fuchs, R., McCarthy, J., Corder, J., Rankine, R., Miller, W., Borky, J., and Gawron, V. *United States Air Force Expeditionary Forces, Vol 1*. Washington, D.C., 1997.

Fuchs, R., McCarthy, J., Corder, J., Rankine, R., Miller, W., and Borky, J. *United States Air Force Expeditionary Forces, Vol 2, Appendices E-H*. Washington, D.C., 1997.

Griffith, Samuel B., II. *The Battle For Guadalcanal.* Philadelphia, PA: J.B. Lippincott Company, 1963.

Hoffman, Jon T. "The Legacy and Lessons of Operation WATCHTOWER." *Marine Corps Gazette* (August 1992): 68-73.

Karig, Walter, Captain, USNR, and Purdon, Eric, Commander, USNR. *Battle Report, Pacific War: Middle Phase.* New York: Rinehart and Company, Inc., 1947.

Kelley, Charles T. Jr., and Kamiya, Eiichi. *Contribution of an AEF to a SWA Contingency: The Basra Breakout.* RAND Annotated Briefing, June 1998.

Kenney, George C. *General Kenney Reports.* New York: Duell, Sloan, and Pearce, 1949. Reprint, Washington: Office of Air Force History, 1987.

King, Ernest J., Fleet Admiral, USN. *U.S. Navy at War, 1941-1945: Official Reports to the Secretary of the Navy.* Washington: United States Navy Department, 1946.

Leckie, Robert. *Strong Men Armed: The United States Marines Against Japan*. New York, NY: Random House, 1962.

Lessons Learned From the Guadalcanal Operation 1942, Combined Operations Headquarters Bulletin No. Y/17, 508.171Y-17, Dec 1942, in the USAF Collection, AFHRA.

Lippincott, Benjamin E. *Extract From Division Commander's Final Report on Guadalcanal Operation. Report From Maj. Gen. A.A. Vandegrift,* 750.04-1x, 7 Aug-8 Dec 1942, in the USAF Collection, AFHRA.

Lippincott, Benjamin E., Lt.Col. *From Fiji Through the Philippines With The Thirteenth Air Force.* San Angelo: Newsfoto Publishing Co, 1948. Microfilm, 750.01-1 1943-1945, in the USAF Collection, AFHRA.

Looney, William R. III, Brig Gen, USAF. "The Air Expeditionary Force: Taking the Air Force into the Twenty-first Century." *Airpower Journal*, Vol X (Winter 1996): 4-9.

Miller, John Jr. *United States Army in World War II, The War in the Pacific, Guadalcanal: The First Offensive.* Washington, DC: U.S. Government Printing Office, 1949.

Miller, Thomas G. Jr. *The Cactus Air Force.* New York, NY: Harper and Row, 1969.

Moore, R. Scott, Maj. "Looking Back at the Future: The Practice and Patterns of Expeditionary Operations in the 20th Century." *Marine Corps Gazette* (August 1993): 73-77.

Morison, Samuel Eliot. *History of the United States Naval Operations in World War II, vol. V, The Struggle for Guadalcanal, August 1942 - February 1943.* Boston: Little, Brown and Company, 1949.

Oral History Interview of Commander S. E. Burroughs, Jr., USN, Commander Air Group, USS Saratoga, in the Bureau of Aeronautics, 9 April 1943. 180.451-1, 9 April 1943, in the USAF Collection, AFHRA.

Oral History Interview of Lieutenant Commander J. O. Cobb, USN, ComPatRon 91, in the Bureau of Aeronautics, 26 April 1943. 180.451-6, 26 April 1943, in the USAF Collection, AFHRA.

Oral History Interview of Colonel A. D. Cooley, USMC, Commanding Officer Marine Air Group 14 - Guadalcanal, in the Bureau of Aeronautics, 17 May 1943. 180.451-23, 17 May 1943, in the USAF Collection, AFHRA.

Oral History Interview of Major George E. Dooley, USMC, VTB Squadron Commander Guadalcanal, in the Bureau of Aeronautics, 16 August 1943. 180.451-1, 16 August 1943, in the USAF Collection, AFHRA.

Oral History Interview of Lieutenant Colonel Fike, USMC, Executive Officer Marine Air Group 23, in the Bureau of Aeronautics, 4 December 1942. 180.451-11, 4 December 1942, in the USAF Collection, AFHRA.

Oral History Interview of Captain J. J. Foss, USMC, Executive Officer, VMF-121, in the Bureau of Aeronautics, 26 April 1943. 180.451-1, 26 April 1943, in the USAF Collection, AFHRA.

Oral History Interview of Major Galer, USMC, Commanding Officer, VMF 224, and Major J. R. Payne, Jr., USMC, Executive Officer, VMF 211, in the Air Information Branch, Bureau of Aeronautics, 6 January 1943. 180.451-16, 6 January 1943, in the USAF Collection, AFHRA.

Oral History Interview of Captain M. B. Gardner, USN, Chief of Staff, ComAirSouPac, in the Bureau of Aeronautics, 13 January 1943. 180.451-18, 13 January 1943, in the USAF Collection, AFHRA.

Oral History Interviews of Lieutenant Commander J. T. Hayward, USN, Commanding Officer, Headquarters Squadron, Fleet Air Wing Two, in the Bureau of Aeronautics, 19 April 1943, and Lieutenant W. P. Hart, A-V(S), USNR, USS Hornet, in the Bureau of Aeronautics, 9 April 1943. 180.451-9, 19 April 1943, in the USAF Collection, AFHRA.

Oral History Interview of Lieutenant Harold H. Larsen, USN, VT-8 USS Hornet, in the Air Information Branch, Bureau of Aeronautics, 18 January 1943. 180.451-19, 18 January 1943, in the USAF Collection, AFHRA.

Oral History Interview Summary of Lt. Marvin Plake, USNR, Air Combat Intelligence Officer, USS Wasp, Intelligence Service USAAF, December 14, 1942. 180.451-1, 14 Dec 1942, in the USAF Collection, AFHRA.

Oral History Interview of Major J. N. Renner, USMC, First Marine Aircraft Wing, Ass't Operations Officer, Commanding Officer VMO-251, Operations Officer MAG-11, in the Bureau of Aeronautics, 17 July 1943. 180.451-7, 17 July 1943, in the USAF Collection, AFHRA.

Oral History Interview of Lieutenant Commander LeRoy C. Simpler, USN, Concerning Operations in the Guadalcanal Area, in the Bureau of Aeronautics, 26 February, 1943. 180.451-1, 26 February, 1943, in the USAF Collection, AFHRA.

Oral History Interview of Major John Smith, USMC, Commanding Officer VMF-223, in the Bureau of Aeronautics, 10 November, 1942. 180.451-1, 1942-43, in the USAF Collection, AFHRA.

Oral History Interview of Lieutenant Commander John S. Thach, USN, Commanding VF-3, USS Saratoga, in the Bureau of Aeronautics, August 26, 1942. 180.451-19, 26 Aug 1942, in the USAF Collection, AFHRA.

Report of Action Tulagi-Guadalcanal Offensive 7-8 August, 1942. Report from Commander USS Saratoga to CINCPACFLEET, 180.261-1, 7-8 Aug 1942, in the USAF Collection, AFHRA.

Report of the Commanding General of the Army Air Forces to the Secretary of War. 1944.

Rust, Kenn C., and Bell, Dana. *Thirteenth Air Force Story…In World War II.* Temple City: Historical Aviation Album, 1981.

Sherman, Frederick C. *Combat Command: The American Aircraft Carriers in the Pacific War.* New York: E.P. Dutton & Company, 1950.

Sherrod, Robert. *The History of Marine Corps Aviation in World War II.* Washington, DC: Combat Forces Press, 1952.

Spector, Ronald H. *Eagle Against the Sun.* New York, NY: Random House, 1985.

Vandegrift, A.A., and Asprey, R. B. *Once a Marine: The Memoirs of General A. A. Vandegrift, United States Marine Corps.* New York: W. W. Norton and Company, Inc., 1964.

Webster's New World Dictionary, Second College Edition. Cleveland: William Collins + World Publishing Co., Inc., 1978.

Willmott, H.P. "Guadalcanal: The Naval Campaign." *Joint Forces Quarterly* (Autumn 1993): 98-106.

Willock, Roger. *Unaccustomed to Fear: A Biography of the Late General Roy S. Geiger, USMC.* Princeton: Roger Willock, 1968.

Wings at War Series, No. 3, Pacific Counterblow. Reprint, Washington: Center for Air Force History, 1992.

Winnefeld, James A., and Johnson, Dana J. *Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991.* Annapolis: Naval Institute Press, 1993.

Zimmerman, Maj. John L. *The Guadalcanal Campaign.* (Marine Corps Historical Monograph) Washington, DC: US Government Printing Office, 1949. Reprint, New York: Greenwood Press, 1969.

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